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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/776,508	02/12/2004	Donald J. Curry	118591	3683

27074 7590 03/16/2007		EXAMINER
OLIFF & BERRIDGE, PLC. P.O. BOX 19928 ALEXANDRIA, VA 22320		TYLER, NATHAN K
	ART UNIT	PAPER NUMBER
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SHORTENED STATUTORY PERIOD OF RESPONSE	NOTIFICATION DATE	DELIVERY MODE
3 MONTHS	03/16/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 03/16/2007.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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PTOL-90A (Rev. 10/06)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11/05/2004*.

2a)☐ This action is **FINAL.**   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 November 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some *   c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date *12052004, 27062005*.

4)☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Specification

1.   The disclosure is objected to because of the following informalities: the attorney docket

numbers used at page one, paragraph 2 to incorporate U.S. Patent Applications by reference

should be replaced with their corresponding U.S. serial numbers.

Appropriate correction is required.

Claim Objections - 37 CFR 1.75(a)

2.   The following is a quotation of 37 CFR 1.75(a):

> The specification must conclude with a claim particularly pointing out and distinctly claiming the subject matter
> which the applicant regards as his invention or discovery.

3.   Claims 2 and 14 are objected to under 37 CFR 1.75(a), as failing to particularly point out

and distinctly claim the subject matter which application regards as his invention or discovery.

Regarding **claim 2**, the term "the filter selecting signal" at line 5 lacks an antecedent

basis. However, it appears from the context of the claim when read in light of the specification

that "the filter selecting signal" should instead read a filter selecting signal; and this will be

assumed for examination purposes.

Regarding **claim 14**, the term "blended image data" at line 2 lacks an antecedent basis in

claim 9. However, it appears from the context of the claim when read in light of the

specification that claim 14 should depend from claim 10 instead of claim 9, as claim 10 provides

antecedent basis for "blended image data"; and this will be assumed for examination purposes.

Claim Rejections - 35 USC § 101

4.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5.   The USPTO "Interim Guidelines for Examination of Patent Applications for Patent

Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Annex IV, reads as

follows:

> Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." In this context, "functional descriptive material" consists of data structures and computer programs which impart functionality when employed as a computer component. (The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive material" includes but is not limited to music, literary works and a compilation or mere arrangement of data.

> When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare In re Lowry, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994) (claim to data structure stored on a computer readable medium that increases computer efficiency held statutory) and Warmerdam, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having a specific data structure stored in memory held statutory product-by-process claim) with Warmerdam, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory).

> In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See Lowry, 32 F.3d at 1583-84, 32 USPQ2d at 1035.

> Claims that recite nothing but the physical characteristics of a form of energy, such as a frequency, voltage, or the strength of a magnetic field, define energy or magnetism, per se, and as such are nonstatutory natural phenomena. O'Reilly, 56 U.S. (15 How.) at 112-14. Moreover, it does not appear that a claim reciting a signal encoded with functional descriptive material falls within any of the categories of patentable subject matter set forth in Sec. 101.

> ... a signal does not fall within one of the four statutory classes of Sec. 101.

> ... signal claims are ineligible for patent protection because they do not fall within any of the four statutory classes of Sec. 101.

6.   **Claim 20** is rejected under 35 U.S.C. 101 because the claimed invention is directed to

non-statutory subject matter as follows.

Claim 20 defines a "storage medium" embodying functional descriptive material.

However, the claim does not define a computer-readable medium or memory and is thus non-

statutory for that reason (i.e., "When functional descriptive material is recorded on some

computer-readable medium it becomes structurally and functionally interrelated to the medium

and will be statutory in most cases since use of technology permits the function of the descriptive

material to be realized" – Guidelines Annex IV). That is, the scope of the presently claimed

"storage medium" can range from paper on which the program is written, to a program simply

contemplated and memorized by a person. The examiner suggests amending the claim to

embody the program on "computer-readable medium" or equivalent in order to make the claim

statutory.

Additionally, claim 20 is drawn to functional descriptive material recorded on a "storage

medium." The specification, at page 21, paragraph 83 defines the claimed "storage medium" as

encompassing non-statutory subject matter such as "a carrier wave or the like."

A "carrier wave" embodying functional descriptive material is neither a process nor a

product (i.e., a tangible "thing") and therefore does not fall within one of the four statutory

classes of § 101. Rather, a "carrier wave" is a form of energy, in the absence of any physical

structure or tangible material.

Because the full scope of the claim as properly read in light of the disclosure

encompasses non-statutory subject matter, the claim as a whole is non-statutory. The examiner

suggests amending the claim to include only tangible computer readable media, while at the

same time excluding the intangible media such as carrier waves or the like. Any amendment to

the claim should be commensurate with its corresponding disclosure.

Claim Rejections - 35 USC § 102

7.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8.   Claims 1, 2, 5, 8, 9, 10, 13, 15, 16, 17, and 20 rejected under 35 U.S.C. 102(b) as being

anticipated by Roetling (US 5,343,309 A).

Regarding **claims 1 and 9**, Roetling discloses generating an estimated screen frequency

of the image data ("An approximate idea of the halftone pattern frequency can be determined by

measuring as the first peak in the autocorrelation function of the image" at column 5, line 16);

selecting one or more filters from a filter bank based on only the estimated screen frequency and

one or more limit parameters ("The low-pass filter is designed to cut off spatial frequencies at or

above the dominant halftone frequency. With a known periodic screen, the filter should remove

the fundamental and the harmonics of the screen frequency." at column 5, line 38; see Figure 2:

the filter control 38 selects one or more filters 36, based on the output of the low pass filter 34

(which is generated based on the screen frequency) and the spatial gradient of the image (limit

parameter). Therefore selection of the filter(s) depends solely on the estimated screen frequency

and a limit parameter).

Regarding **claims 2 and 10**, Roetling discloses filtering the image data using selected one

or more filters from the filter bank ("The original halftone image is filtered with an adaptive

spatial filter" at column 5, line 57); and blending the one or more filtered image data to form

blended image data based on the filter selecting signal ("The spatial gradient information

controls the adaptation of the filter, namely, for each pixel point, the spatial filter is adjusted" at

column 5, line 58. Each pixel is filtered by a potentially different filter chosen by the filter

selecting signal. Therefore, the resulting filtered image is the result of the output of several

filters blended together based on the filter selecting signal).

Regarding **claims 5 and 13**, Roetling discloses generating intermediate filter selecting

signals based on the estimated screen frequency (Figure 2, output of "Low Pass Filter" 34 is

intermediate signal "FAI", see above grounds for rejection); generating a filter selecting signal

based on the intermediate filter selecting signals and the one or more limit parameters (Figure 2,

output signal from "Filter Control" 38 is based on "FAI" signal and the spatial gradient of the

image data (limiting parameter)); selecting the one or more filters from the filter bank based on

the filter selecting signal ("after the aspect ratio is selected in the block 44, a filter having the

selected aspect ratio is selected in a block 46." at column 7, line 49).

Regarding **claim 8**, Roetling discloses that the operations of generating, selecting

filtering and blending are performed dynamically (see Fig. 2. Operations are performed

dynamically by virtue of the iterative flow of the pixel data).

Regarding **claims 15, 16 and 17,** Roetling discloses a xerographic marking device, a scanning device, and a digital photocopier incorporating the apparatus of claim 9 ("Input halftone images are obtained from a scanner... The system computer 16 is programmed to convert the halftone images to continuous tone images and to edit the continuous tone images as desired for subsequent printing." at column 4, line 31).

Regarding **claim 18,** "means for generating" will be interpreted as being implemented using hardware and/or a software/hardware combination. Roetling discloses means for generating an estimated screen frequency of the image data; and means for selecting one or more filters from a filter bank based on only the estimated screen frequency and one or more limit parameters (see grounds for rejection for claim 1).

Regarding **claim 20,** Roetling discloses a storage medium storing a set of program instructions executable on a data processing device ("PROGRAMMED COMPUTER PROCEDURE FOR HALFTONE IMAGE UNSCREENING" at column 6, line 18), the set of program instructions comprising instructions for generating an estimated screen frequency of the image data; and instructions for selecting a plurality of filters from a bank of filters based on only the estimated screen frequency and one or more limit parameters (see above grounds for rejection).

Claim Rejections - 35 USC § 103

9.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10.   Claims 3, 4, 6, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Roetling and Lopez et al (US 5822467 A).

Regarding claims **3 and 11**, while Roetling discloses processing the blended image data ("the final output contone image can be processed as desired to enhance it, change its contrast, etc" at column 8, line 31), Roetling does not disclose sharpening selected portions of blended image data based on luminance of the blended image data.

Lopez discloses sharpening selected portions of blended image data based on luminance of the blended image data (If an operator selects a feature called auto-sharpening, an automatic filtering operation is provided in which an appropriate level of sharpening is determined based on an image type... the degree of sharpening is made a function of intensity" at column 2, line 19).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to use the sharpening filter taught by Lopez to enhance the blended image data as taught by Lopez, so that the blended image data could be sharpened without accentuating noise in dark areas of the image ("A Laplacian operator, while providing useful edge enhancement in light areas of an image, also accentuates noise in the dark areas of an image... For some images, there is a need for image sharpening without accentuating noise in the dark areas of the image" at Lopez column 1, line 62).

Regarding claims **4 and 12**, the combination of Roetling and Lopez as applied to claim 3

discloses increasing sharpness of a selected portion, if a luminance of the selected portion is

below a predetermined threshold ("If a pixel has a numerical value greater than a threshold

(decision 204), a first value of K is used (box 206). If a pixel has a numerical value less than the

threshold, a second value of K is used" at Lopez column 5, line 35), a magnitude of sharpness

being increased with increasing magnitude of the luminance ("Pixels with low intensity receive

relatively little or no filtering... Pixels with higher intensity receive relatively more filtering" at

column 2, line 27).

Regarding **claim 6**, the combination of Roetling and Lopez as applied to claim 3

discloses selecting a luminance component of a portion of the blended image data; and adjusting

the luminance component of the portion of the blended image data based on a sharpness control

signal (Fig. 2: output of block 204 "pixel value > threshold" is the sharpness control signal).

Regarding **claim 19**, "means for blending" will be interpreted as being implemented

using hardware and/or a software/hardware combination. The combination of Roetling and

Lopez as applied to claim 3 discloses means for blending the one or more filtered image data

from one or more selected filters into blended image data (see grounds for rejection for claim 2);

and means for increasing sharpness of a selected portions of blended image data if a luminance

of a selected portion is below a predetermined threshold, a magnitude of sharpness being

increased with increasing magnitude of the luminance (see grounds for rejection for claim 4).

11.   Claims 7 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over the

combination of Roetling and Sakatani et al. (US 6538771 B1).

Regarding claims **7 and 14**, while Roetling discloses processing the blended image data, Roetling does not disclose selecting chroma components of a portion of the blended image data; and adjusting the chroma components of the portion of the blended image data based on a neutral control signal.

Sakatani discloses selecting chroma components of a portion of the blended image data; and adjusting the chroma components of the portion of the blended image data based on a neutral control signal (Fig. 4, numeral 405: "Gamma correction." Neutral control signal comes from numeral 407 "CPU").

It would have been obvious at the time the invention was made to one of ordinary skill in the art to perform gamma correction as taught by Sakatani on image data that has been de-screened as taught by Roetling, so that the de-screened image data can be accurately reproduced by the printer ("In the gamma correction processor 405, gradation correction is performed so that the density is reproduced linearly for the input image data" at Sakatani column 7, line 12).

Conclusion

12.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan K. Tyler whose telephone number is 571-270-1584. The examiner can normally be reached on M-F 7:30am - 5:00pm.
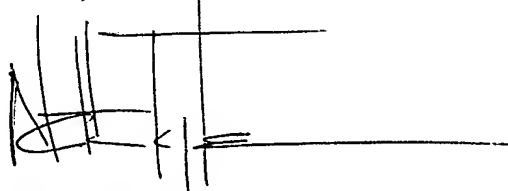
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Werner can be reached on 571-272-7401. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

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like assistance from a USPTO Customer Service Representative or access to the automated

information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Nathan K Tyler
Examiner
Art Unit 2609

BRIAN WERNER
SUPERVISORY PATENT EXAMINER